ORIGINAL ARTICLE

ANNALS OF PUNJAB MEDICAL COLLEGE

Behavior Symptoms among Children with Attention Deficit Hyperactivity Disorder: A Psychosocial Intervention through Mothers

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Submitted for Publication: 29-12-2022
Accepted for Publication 16-06-2023

How to Cite: Fatima G, Masih S, Maqbool S. Behavior Symptoms among Children with Attention Deficit Hyperactivity Disorder: A Psychosocial Intervention through Mothers. APMC 2023;17(2):236-242. **DOI: 10.29054/APMC/2023.1310**

ABSTRACT

Background: The physical, emotional, and psychological health of children, as well as their family and the community at large, are all negatively impacted by attention deficit hyperactivity disorder. Which also has a significant effect on children's behavior. ADHD is linked to problems with family functioning, problems in the parent-child bond (particularly with mothers), worse parenting efficacy, and higher levels of parental stress. **Objective:** To determine the effect of mothers' psychosocial interventions on the behavioral symptoms of children with attention deficit hyperactivity disorder. **Study Design:** Quasi-experimental study. **Settings:** Developmental OPD of Tertiary Care hospital Lahore Punjab Pakistan. **Duration:** The duration of data collection was 09 months after the approval of synopsis from Research Ethical Committee (REC), The University of Lahore. **Methods:** A quasi-experimental study was conducted at the developmental OPD of Tertiary Care hospital Lahore Punjab. The study participants were mothers of children with Attention Deficit Hyperactivity disorder. Purposive sampling technique was used, total 45 participants in each intervention and control group was recruited. A validated questionnaire of Behavior Disorder Rating Scale consisted of 45 items was used. Data were collected by primary researcher and entered into SPSS version 21. **Results:** The study observed that majority of the mothers were aged 26-30, with 52.2% having a family size of 3-6 people and 47.7% having more than 6 people in family. Among mothers of ADHD children, 20% lived in rural areas and 80% in urban areas. ADHD children aged 4-8 were 72.2% of the sample. In the control group, 75.6% of ADHD children had borderline behavior, compared to 64.4% in the intervention group. Initial mean ranks for the control group were 45.51, significantly rising to 65.30 post-assessment. There is a need for psychosocial intervention through mothers to decrease the behavioral symptoms of children with ADHD. Conversely, in the intervention group the pre-intervention mean score of behavioral symptoms was (45.49) which significantly decreased after intervention (25.70) (p>.001). **Conclusion:** It can be concluded that there is an effect of psychosocial intervention on the behavioral symptoms of children with ADHD.

Keywords: *Attention deficit hyperactivity, Behavioral symptoms, Children.*

INTRODUCTION

Attention deficit hyperactivity disorder (ADHD) is a Neurodevelopmental disorder is characterized by symptoms of impulsivity, hyperactivity, and inattention. ADHD has a negative effect on both academic and social functioning. The physical, emotional, and psychological health of children, as well as their family and the community at large, are all negatively impacted by attention deficit hyperactivity disorder, which also has a significant effect on children's behavior. ADHD is linked to problems with family functioning, problems in the parent-child bond, worse parenting efficacy, and higher levels of parental stress.[1]

Out of the most commonly reported causes of ADHD i.e. genetic, neurological, biological and environmental risk factors. The inherited and molecular genetics contribute to ADHD suggest an important overlap than other neurodevelopmental problems. Some genes associated with dopaminergic receptor genes 9DRD4-DRD5), dopamine B- hydroxylases, dopamine transporter gene

which catalysis conversion of dopamine to norepinephrine. Abnormalities in prefrontal cortex associated sub cortical structure and circuits that disturb catecholamine neurotransmitters. ADHD have depleted level of dopamine and nor-epinephrine thought to be largely result of dysfunction of their receptive transporter system prolongs sodium related signals transduction.[2]

Brain gut axis bacterial genus may generate allergen and effect neurotransmitter release that lead to ADHD such as increase faeclibacterium that exert inflammatory cytokines effects that cross blood brain barrier or effect brain development and functions. Increase Enterococcus leads to excess intestinal conversion of levodopa to dopamine. Peripheral levodopa cannot penetrate to blood brain barrier to enter the CNS and reduce effect of levodopa. Abnormalities in vitamin B6 metabolic pathway and excitatory glutamate and inhibitory GABA neurotransmitter control motor and stimulation if the GABA neurotransmitter loss that cause hyperactivity.[3]

Similarly, ADHD remain prevalent globally and are also speculated to have a high occurrence in Pakistan although very little information is available.[4] The prevalence of ADHD children in Pakistan is around (34.5%), (47.0%) in male and (52.9%) in females.[5]

It has been frequently seen that the Families of children with ADHD have many challenges and upbringing a child with ADHD is difficult and influence on family functioning and handling disruptive behaviors of children greatly effect parents well-being that cause negative or poor parenting.[6]

Concurrently, Caregiving is a complex activity families often care for children with mental disabilities. In this study, the stress levels of parents of intellectually challenged children were measured (autistic spectrum disorder, intellectual disability and attention deficit hyperactivity disorder a scale for measuring stress. According to the study's findings, around 64.3% of carers (mothers) reported experiencing severe stress, 21.7% reported moderate stress, and 13.8% reported mild stress. This study came to the conclusion that stress among caregivers has a significant role in determining their workload and psychological pressure.[7]

Likewise, children's at home, failing to fulfill requests and directions and repeatedly switching from one unfinished task to another due to short attention span, difficulties engaging in tasks that require sustained mental efforts such as homework, difficulty waiting your turn, disorganize and easily distracted are examples of the in-attention behavioral symptoms. In the classroom, inattentiveness manifests as problems finishing assignments, doing work accurately, or planning time and resources.[8]

Additionally, behavioral symptoms of impulsivity are displayed at home by interfering with and bothering other people (family members), as well as by acting carelessly. Blurting out responses to questions, not fully hearing or reading instructions before starting work, and interrupting teachers and other students are all examples of impulsivity in the classroom. Work is frequently done carelessly and impulsively.[8]

Furthermore, talking too much and being unable to enforce regulations by being silent or controlling one's behavior; a child who is always moving and difficult to control in shopping centers A few instances of hyperactive behavioral symptoms that can be observed at home include excessive climbing in unsuitable situations, an easy tendency to become sidetracked when given instructions, a conscious desire to irritate others, occasional temper outbursts, and unpredictable behavior. In the classroom, hyperactivity is demonstrated by fidgeting, wriggling, trouble staying sitting, manipulating items, and running about.[9]

In Pakistan, a study was conducted in 2018 by Maheen. In which out of 77 ADHD children's, that are found out that around 53.2% were suffering from ADHD inattention, 23.3% children were found out to be suffering from ADHD hyperactivity and 23.3% were found out to be combined type.[5]

Nurses play a crucial role on teams that offer support, treatment, and diagnostic services to kids and their families at home and at school.[10] A nurse's duties include educating patients and their parents and listening to medical professionals. Guidance and an evaluation of the parents' awareness and treatment knowledge should be part of the intervention. To teach them the methods to utilize to treat their children with challenging behaviors, parents should be trained about psychosocial nursing intervention. When providing medical care, the nurse should take into account the views of every member of the family. Additionally, as the primary caregiver for their children, parents have a special responsibility in the management of ADHD. Counseling or psycho-educational sessions may be useful in easing the stress and anxiety associated with raising children with ADHD in mothers.[11]

Concurrently, according to the results of numerous studies and reviews of the literature that looked at the effects of psychosocial intervention in treating ADHD led to the conclusion that it is an evidence-based treatment[12]. The parent training program for psychosocial intervention, which tackles a variety of important issues,

is the first-line therapy for stress management and lowering behavioral symptoms in children with ADHD, according to NICE (National Institute of Health and Clinical Excellence) employed.[13] The outcome of psychosocial intervention demonstrates a decrease in children's inattention, hyperactive, and aggressive behaviors, an improvement in parental behavior, and a decrease in parent stress by empowering mothers to control their children's.[14]

The basic aim of psychosocial interventions are to cover important areas, and factors contributing to stress in mothers. Therapist encourage mothers to express her positive and negative feelings about child's behaviors. Then therapist explore the benefits of these strategies, how to cope with stress causing situation, how to modify child expectations and reframing of priorities.[15] These strategies change the mind, way of thinking and behavior of the mothers, so mothers enable to motivate them to improve her communication, promote empowerment, behavior and relationships with the children and other family members. This will not only decrease stress level among mothers but improve the mother child relationship and development of children as well. They learn how to pinpoint problematic behaviors, keep an eye out for them, praise prosocial conduct, and reduce undesired behavior through planned ignoring, time outs, and other non-physical methods of punishment.[16]

The objective of the study was to determine the effect of mothers' psychosocial interventions on the behavioral symptoms of children with attention deficit hyperactivity disorder.

METHODS

A quasi-experimental study was conducted in developmental OPD of Tertiary Care Hospital Lahore. The duration of data collection was 09 months after the approval of synopsis from Research Ethical Committee (REC), The University of Lahore. The rules and regulations set by the Researcher Ethical Committee of The University of Lahore were followed while conducting the research and the rights of the research participants were respected. Permission was taken from head of the department of developmental OPDs and Medical Superintendent. Written informed consent was taken from all the mothers of ADHD children along with their ascents. The study participants we mothers of children with ADHD visiting the developmental OPD for treatment. A non-probability purposive sample of n=45 participants in each intervention and control group was recruited based on Children who had ADHD symptoms,4 to 12 years, mild to moderate stage of ADHD. The exclusion criteria was Children with mental retardation, major neurological disorder those children whose mothers were high level of stress and on pharmacological treatment. The sample were calculated with 95% confidence interval, 80% power of the test expected mean total score of PSI in group A (Control group) as 45 and in group B (Intervention group) as 45.[1] All information and data collection was kept confidential. Participants were kept anonymous throughout the study. A validated questionnaire of Behavior Disorder Rating Scale questionnaire consist of 45 items, on three categories (Inattention, Hyperactivity and Impulsivity) to determine the Behavioral Symptoms (scoring 1=not at all, 2=just a little, 3=pretty much and 4=very much) the minimum score was 45 and the maximum score was180. The questionnaire was validated from five experts. Content Validity index testing was done to check the content validity. The CVI for Behavioral Disorder Scale questionnaire was (0.9866). Primary Researcher collect the data, it was entered into SPSS version 21 for analysis. For quantitative variables, the results were presented as mean ranks. On the other hand, variables were presented as frequency and percentages. The normality test was applied, to check the normal distribution of data, a Kolmogorov- Smirnov test was used. The results revealed that data were not normally distributed (P value < 0.05). Therefore, a non-parametric test (Mann- Whitney U test) was used to compare scores in pre or post data of both groups for hypothesis testing.

RESULTS

Demographics of Mothers and ADHD children's:

Concerning mother's demographic characteristics in this study shows that the majority of the participants age between (26-30 years) was 44(48.5%), (18-25 years) was 25(27.7%), (31-35 years) was 18(20.2%), more than 35 years was 3(3.5%). In this study the number of children's one 30(33.3%), two 38(42.2%), three 12(13.3%) and more than three 10(11.2%) and type of family joint family was 35(38.8%) and single family was 55(61.2%). The majority of the participant's family size 3-6 persons was 47(52.2%) and more than 6 persons was 43(47.7%). Education level illiterate 3(3.3%), matric 20(22.2%), intermediate 16 (17.7%), bachelor degree 30(33.3%) and master's degree 21(23.3%). In this study the residence of mothers of ADHD children's majority in urban 72(80%) and in rural was 18 (20%) reveals in table 1.

The majority of the ADHD children's age 65(72.2 %) children's were between 4-8 years whereas 25 (27.8%) were between 8-12 years. In this study majority of the children's 62(68%) were boys and 28(31%) were girls reveals in table 2.

Table 1: Demographic characteristics of the ADHD Mothers

Demographic characteristics		Frequency	Percentage
Age of Mothers	18-25 years	25	27.7%
	26-30 years	44	48.5%
	31-35 years	18	20.2%
	More than 35 years	3	3.5%
Number of children's	One	30	33.3%
	Two	38	42.2%
	Three	12	13.3%
	More than three	10	11.2%
Type of family	Joint family	35	38.8%
	Single family	55	61.2%
Family Size	3-6 person	47	52.2%
	More than 6 persons	43	47.7%
Mother Education level	Illiterate	3	3.3%
	Matric	20	22.2%
	Intermediate	16	17.7%
	Bachelor degree	30	33.3%
	Master's Degree	21	23.3%
Residence	Rural	18	20%
	Urban	72	80%

Table 2: Demographic characteristics of the ADHD children's

Demographic characteristics		Frequency	Percentage
Age of ADHD Children	4-8 years	65	72.2 %
	8-12 years	25	27.8%
Gender of DHD Children	Male	62	68%
	Female	28	31%

Behavioral symptoms of ADHD Children:

Table 3 reveals that in control group the majority of the participants 34(75.6%) were having borderline range of behavior and 24.4% were having mild range behavior in the pre assessment of control group as it was one of the inclusion criteria. In contrast, in the post assessment, there was no significant decrease scores which turns the children towards mild to moderate behavior retrospectively.

Whereas, in intervention group the behavioral symptoms among ADHD children 29(64.4%) were having borderline range of behavior and 16(35.6%) were having mild range behavior in the pre intervention assessment Participants were needed immediate action because their health and well-being were threatened before the intervention which was improved to 20 (44.4%) of them reported normal behavior and 22 (48.9%) reported mild range behavior in the post intervention assessment, which was found significant decrease scores which turns the children towards mild or normal behavior.

Table: 3 Behavioral symptoms of ADHD Children in control group and intervention group (n=45, n=45)

Behavioral symptoms	Control Group		Intervention Group	
	Pre N (%)	Post N (%)	Pre N (%)	Post N (%)
Normal behavior, (≤ 90), (≤50%)	0 (0%)	2 (4.4%)	0 (0%)	20 (44.4%)
Mild range behavior, (>90-120), (>50%__67%)	11 (24.4%)	17 (37.8%)	16 (35.6%)	22 (48.9%)
Borderline range of behavior, (>120-140), (> 67%-78%)	34 (75.6%)	26 (57.8%)	29 (64.4%)	3 (6.7%)
Clinical range of behavior, (>140), (>78%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

Table 4 reveals that in control group the pre assessment mean ranks were (45.51) which significantly increase in post assessment (65.30). There was an increase in mean ranks in post assessment as compared to before in control group as evident by P >0.05.

Whereas pre intervention mean scores were (45.49) which significantly decrease after intervention (25.70). A significant difference was found between mothers stress scores before and after intervention as evident by P<0.05. Therefore, I can be concluded that there is an effect of psychosocial intervention on behavioral symptoms of children with ADHD.

Table: 4 Effects of Psychosocial Intervention on behavioral symptoms score (n=45, n=45)

Value	Score Label	Control Group (Mean Ranks)	Interventional Group (Mean Ranks)	Mann-Whitney U	P-value
Behavioral Symptoms	Pre-Assessment	45.51	45.49	1012.000	0.997
	Post Assessment	65.30	25.70	121.500	0.000

** p value was obtained by **Mann-Whitney U** test with 0.05 level of significance.*

DISCUSSION

The current study majority of mothers were age between (26-30 years) was 44(48.5%), (18-25 years) was 25(27.7%), (31-35 years) was 18(20.2%), more than 35 years was 3(3.5%). According to a study the mother's age were 31-49 years old[18]. Another study in support to present study reported that more than half of mother's age was less than 35 years[18]. Another study finding was consistent with who stated that mothers' age was between 35-45 years[20].

Regarding the number of children's one 30(33.3%), two 38(42.2%), three 12(13.3%) and more than three 10(11.2%) and type of family joint family was 35(38.8%) and single family was 55(61.2%). A study in support to present study all the mothers in this study living as single family[21]. In present study the Family size 3-6 persons 47(52.2%) and more than 6 persons was 43(47.7%). Approximately about half of the families (45%) having 3-6 persons at home and more than half of them (69.2%) were married.[18,19]

In relation to the level of education, majority of the participants bachelor degree 30(33.3%), master's degree 21(23.3%), matric 20(22.2%), intermediate 16 (17.7%), and illiterate 3(3.3%). Surprisingly, all of the mothers in this study had completed secondary school and five of the mothers had received post-secondary education.[21]

Results further indicates that the residence of mothers of ADHD children's majority in urban 72(80%) and rural was 18 (20%). A study in support to this study by.[20] 61.6%of mother's residence in urban areas. These findings were conflicting with Danielson et al., (2018) the results of the current study also illustrated that nearly half of the mothers had secondary education. This could be due to that majority of mothers are from rural.[22]

Finding revealed that, the age of 65(72.2 %**)** children's were between 4-8 years and 25 (27.8%) were between 8-12 years. A study is in support of a current study finding, in which participants were children aged 3 to 12 years had ADHD 6.1–9.4%.[23] According to a survey conducted by Adonna et al., 8.7% of Nigerian children's aged 7 to 12 had ADHD. One more study conducted in which the mean age of ADHD children was 9.4.

The current study were 62(68%) boys and 28(31%) were girls**.** A study is in support of a current study finding, in which participants were 204 children aged 6-17 years old with ADHD 129(63%) boys, and 75 (36%) girls. ADHD is more likely to be diagnosed and treated in boys than girls.[10] One more study conducted by Anderson in 2015 which ADHD in boys was 38% and in girls was 11%.[24]

Regarding a child's demographics, the sample of ADHD children's consisted of roughly two thirds boys and one third girls. It might be because of the biological make-up of the female does not give obvious problematic consequences as a male.[25] The findings of a study was found similar to current study who reported that 6.9% of youngsters in the Menoufia Governorate had ADHD. With a male to female ratio of approximately, there was a higher prevalence of ADHD in male children. The fact that girls with ADHD were more likely than boys to have the inattentive form of the disorder and less likely to exhibit evident issues may account for the lower diagnosis rate among females in childhood, according to this result.[26]

The behavior symptoms of children with ADHD in intervention group pre assessment scores majority of the children's 29(64.4%) were having borderline range of behavior and 16(35.6%) mild range of behavior but in post assessment the 20(44.4%) having normal symptoms, 22(48.9%) were having mild behavior symptoms and 3(6.7%) were having borderline range of behavior symptoms. The behavior symptoms of children with ADHD in control group pre assessment scores majority of the children's 34(75.6%) were having borderline range of behavior and 11(24.4%) were mild range of behavior but in post assessment the 26(57.8%) were having borderline range of behavior symptoms, 17(37.8%) were having mild behavior symptoms and 2(4.4%) having normal symptoms. The findings of this study in support to current study findings, in which the mean score of the pre intervention scores was and post intervention scores after following the execution of the psychosocial intervention program. One more study was carried out by Zeinab N in 2014. According to the results of study, There was a statistically significant decrease in the mean total scores recorded by parents is (P 0.001).[13]

There is a significant difference in pre and post scores of behavioral symptoms of children with ADHD. The pre intervention mean scores were (45.49) which significantly decrease after intervention (25.70), the p value is less than 0.05. There was a reduction in mean scores after the intervention as compared to before. Therefore, I can be concluded that there is an effect of psychosocial intervention on behavioral symptoms of children with ADHD. The findings of a study in support to current study's findings, in which the mean score of the pre intervention scores and post intervention scores p value 0.015 after following the execution of the educational intervention program.[27]

CONCLUSION

The majority of the mothers age between 25-35 years, two or more children's and they lived as single family in urban area are more prone to stress and their children's had more behavioral symptoms. Behavioral symptoms were more common among 4-8 years male children's. Stress in mothers has a noticeable impact on the behavior symptoms of children with ADHD. This study focuses on the impact of psychosocial intervention delivered through mothers on behavioral symptoms among children with attention deficit hyperactivity disorders (ADHD). The findings of this study highlight the critical role of mothers stress in the management of ADHD symptoms among children. The results indicate that

when mothers received a psychosocial intervention, their stress level were significantly reduce, and this led to significant decrease in the behavior symptoms of their children. Overall, the study provides evidence that a psychosocial intervention targeting mothers stress, enhance their understanding can have a positive impact on the well-being of the child and management of ADHD symptoms among children's. Research suggest that when mothers receive support and learn stress management techniques, it can positively influence their ability to cope with challenges associates with parenting a child with ADHD.

LIMITATIONS

- Sample consist of specific demographics or drawn from a single location.
- The study might be relatively short follow-up period.
- Participant's dropout rates affect the validity of results.
- Lack of control for confounding variables.

SUGGESTIONS / RECOMMENDATIONS

- Nurses should receive comprehensive education and training in ADHD and psychosocial intervention to effectively support mothers and families.
- Familiarize nurses with evidence based psychosocial intervention that have shown positive effects on mothers stress and behavioral symptoms of children's with ADHD.
- Future researches should aim to use randomized control trials with larger and more diverse sample, longer follow-up period and objective measures of outcome.
- Encourage collaborative care between Nurses, pediatricians, psychiatrists, psychologists and other health care providers to involve in child's care.
- Develop evidence based guidelines based on this study findings to collaborate with other health care professionals to develop evidence based guidelines for nurses and health care administration.

CONFLICT OF INTEREST / DISCLOSURE

The author declares no conflict of interest

ACKNOWLEDGEMENTS

I am grateful to my supervisor, Mr. Sarfraz Masih, for his ongoing mentorship and never-ending supply of fascinating tasks.

I would like to thank Mr. Afsar Ali and Ms. Hajra Sarwar for significant support and insights that helped me in initial work.

Last but not the least, I would like to thank my parents Mr. Faqir Hussain and Mrs. Munawar Sultana, without you none of this would indeed be possible.

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